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EXAMINER

TAYLOR, BARRY W

ART UNIT PAPER NUMBER

2617

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/015,993

Applicant(s)

CHIEN ET AL.

Examiner

Barry W. Taylor

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-10, 13, 15-17, 21, 22, 27-29, 33, 35-37 and 41 is/are rejected.
- 7) ☒ Claim(s) 5-7, 11, 12, 14, 18-20, 23-26, 30-32, 34 and 38-40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-4, 8-10, 13, 15-17, 21-22, 27-29, 33, 35-37 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petty (5,187,722) in view Fan (2002/0121938) further in view of Lim et al (7,092,675 hereinafter Lim).

Regarding claims 1 and 33. Petty teaches an integrated radio comprising a fractional synthesizer (title, abstract, figures 1-6) comprising:

a forward path operably coupled to produce an output frequency from a reference frequency (see input and output frequencies in figures 1-6) and a feedback

Art Unit: 2617

reference frequency that is based on a divider value (item 105 figures 1-3 item 401 figures 4-6);

a configurable feedback path operably coupled to produce the feedback frequency (see FRACTIONAL MULTIPLY in figures 4-6).

Petty does not explicitly show first and second feedback path selected based on whether or not a fractional value of the divider is within a range of fractional values.

Fan also teaches fractional frequency divider wherein the fractional divider is configured to selectively divide the output of the voltage controlled oscillator by either N or $N+1/2$ for fractional components less than 0.5, or, by either $N+1/2$ or $N+1$ for fractional components greater than 0.5 thereby reducing phase error by half which provides for better performance (title, abstract, paragraphs 0012 and 0022).

According to Applicants amendment and remark pages 24-35, paper dated 9/8/05 Petty and Fan do not show two distinct feedback loops instead they use common circuit for single path.

Lim also teaches frequency synthesizer but improves on prior art teachings of using common circuit used for common path (col. 1 line 60 – col. 3 line 4) by using a first and second feedback paths (col. 3 lines 5-26, col. 62 line 57 – col. 63 line 14) to allow for coarse and fine tuning thereby reducing noise sensitivity.

It would have been obvious for any one of ordinary skill in the art at the time of invention to utilize the teachings of Lim into the teachings of Petty and Fan in order to

Art Unit: 2617

reduce phase errors and noise thereby improving performance and saving on power consumption.

Regarding claims 2 and 35. Petty in view of Fan do not explicitly show charge pump being used.

Lim also teaches frequency synthesizer but improves on prior art teachings of using common circuit used for common path (col. 1 line 60 – col. 3 line 4) by using a first and second feedback paths (col. 3 lines 5-26, col. 62 line 57 – col. 63 line 14) to allow for coarse and fine tuning thereby reducing noise sensitivity. Lim further shows charge pump to be supplied to a loop filter which is supplied to voltage controlled oscillator (see below).

The phase detector circuitry 882 receives filtered mixed signal 3230A and filtered IF signal 3235A. Depending on the relative phase of the filtered mixed signal 3230A and the filtered IF signal 3235A, the phase detector circuitry 882 provides offset PLL error signal 884 to charge-pump circuitry 3240. A control signal 3270H controls the operation of charge-pump circuitry 3240. Charge-pump circuitry 3240 may have a circuit arrangement as is known to persons of ordinary skill in the art. In response to the offset PLL error signal 884, charge-pump circuitry 3240 generates packets of charge that it supplies to loop filter circuitry 886 as output signal 3243. Loop filter circuitry 886 filters output signal 3243 and generates VCO control signal 3247. Buffer circuitry 3250 buffers VCO control signal 3247 to provide control signal

Art Unit: 2617

2020 to VCO circuitry 481. VCO circuitry 481 uses control signal 2020 to fine-tune its output frequency by adjusting the continuously variable capacitor 1710 (not shown explicitly in FIG. 32), as described above in detail. Controller circuitry 3205 controls the operation of loop filter circuitry 886 via a control signal 3270G.

It would have been obvious for any one of ordinary skill in the art at the time of invention to utilize the teachings of Lim into the teachings of Petty and Fan in order to phase errors and noise thereby improving performance.

Regarding claims 3, 10, 17, 22, 29, and 36. Petty does not show sigma delta modulator.

Fan also teaches fractional frequency divider wherein the fractional divider is configured to selectively divide the output of the voltage controlled oscillator by either N or $N+1/2$ for fractional components less than 0.5, or, by either $N+1/2$ or $N+1$ for fractional components greater than 0.5 thereby reducing phase error by half which provides for better performance (title, abstract, paragraphs 0012 and 0022). Fan teaches using sigma-delta modulator to control the frequency divider (paragraphs 0006, 0007, 0013, 0022, 0028, 0029, 0030).

It would have been obvious for any one of ordinary skill in the art at the time of invention to utilize the teachings of Fan into the teaching of Petty in order to reduce phase errors thereby improving performance and saving on power consumption.

Regarding claims 4 and 37. Fan teaches a fixed divider (see 150 figure 1, paragraphs 0004 – 0011).

Art Unit: 2617

Regarding claims 8 and 41. Petty in view of Fan do not show controller being used.

Lim also teaches frequency synthesizer but improves on prior art teachings of using common circuit used for common path (col. 1 line 60 – col. 3 line 4) by using a first and second feedback paths (col. 3 lines 5-26, col. 62 line 57 – col. 63 line 14) to allow for coarse and fine tuning thereby reducing noise sensitivity. Lim further shows charge pump to be supplied to a loop filter which is supplied to voltage controlled oscillator , as well as , a controller (see below).

Description Paragraph - DETX (144):

During the transmit mode, the interface controller circuitry 1116 provides control signals via signal lines 1160 to the interface signal lines 960 and 965. The interface controller circuitry 1140 receives the control signals via signal lines 1165 and provides them to various blocks within the receiver analog circuitry, as desired. During the receive mode, the interface controller circuitry 1116 inhibits (e.g., high-impedance state) the signal lines 1160. Similarly, the interface controller circuitry 1140 inhibits the signal lines 1165 during the receive mode.

Description Paragraph - DETX (145):

For the purpose of conceptual illustration, FIG. 11A shows the interface controller circuitry 1116 and the interface controller circuitry 1140 as two blocks of circuitry distinct from the interface controller circuitry 1010 and the interface controller circuitry 1040 in FIG. 10, respectively. One may combine the functionality of the interface controller circuitry 1116 with the

Art Unit: 2617

functionality of the interface controller circuitry 1010, as desired.

Likewise, one may combine the functionality of interface controller circuitry

1140 with the functionality of the interface controller circuitry 1040, as

desired. Moreover, one may combine the functionality of the signal processing

circuitries 1110 with the functionality of the interface controller circuitry

1116 and the interface controller circuitry 1140, respectively.

Combining the

functionality of those circuits depends on various design and implementation

choices, as persons skilled in the art understand.

It would have been obvious for any one of ordinary skill in the art at the time of invention to utilize the teachings of Lim into the teachings of Petty and Fan in order to phase errors and noise thereby improving performance.

Method claims 9 and 15 are rejected for the same reason as apparatus claims 1 and 33 since the recited apparatus would perform the claimed method steps.

Regarding claims 13, 16 and 28. Fan teaches determining fractional and integer value to be used (see N or $N+0.5$ or $N+0.5$ or $N+1$ in figure 2).

Program claims 21 and 27 are rejected for the same reasons as apparatus claims 1 and 33 since the recited apparatus would perform the claimed program steps.

Allowable Subject Matter

2. Claims 5-7, 11-12, 14, 18-20, 23-26, 30-32, 34 and 38-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2617

Response to Arguments

3. Applicant's arguments with respect to claim 1-4, 8-10, 13, 15-17, 21-22, 27-29, 33, 35-37 and 41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry W. Taylor, telephone number (571) 272-7509, who is available Monday-Thursday, 6:30am to 5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost, can be reached at (571) 272-7872. The central facsimile phone number for this group is **571-273-8300**.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2600 receptionist whose telephone number is (571) 272-2600, the 2600 Customer Service telephone number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Barry W. Taylor
Art Unit 2617


BARRY TAYLOR
PRIMARY EXAMINER